

Water Education Workshop: Research Perspectives

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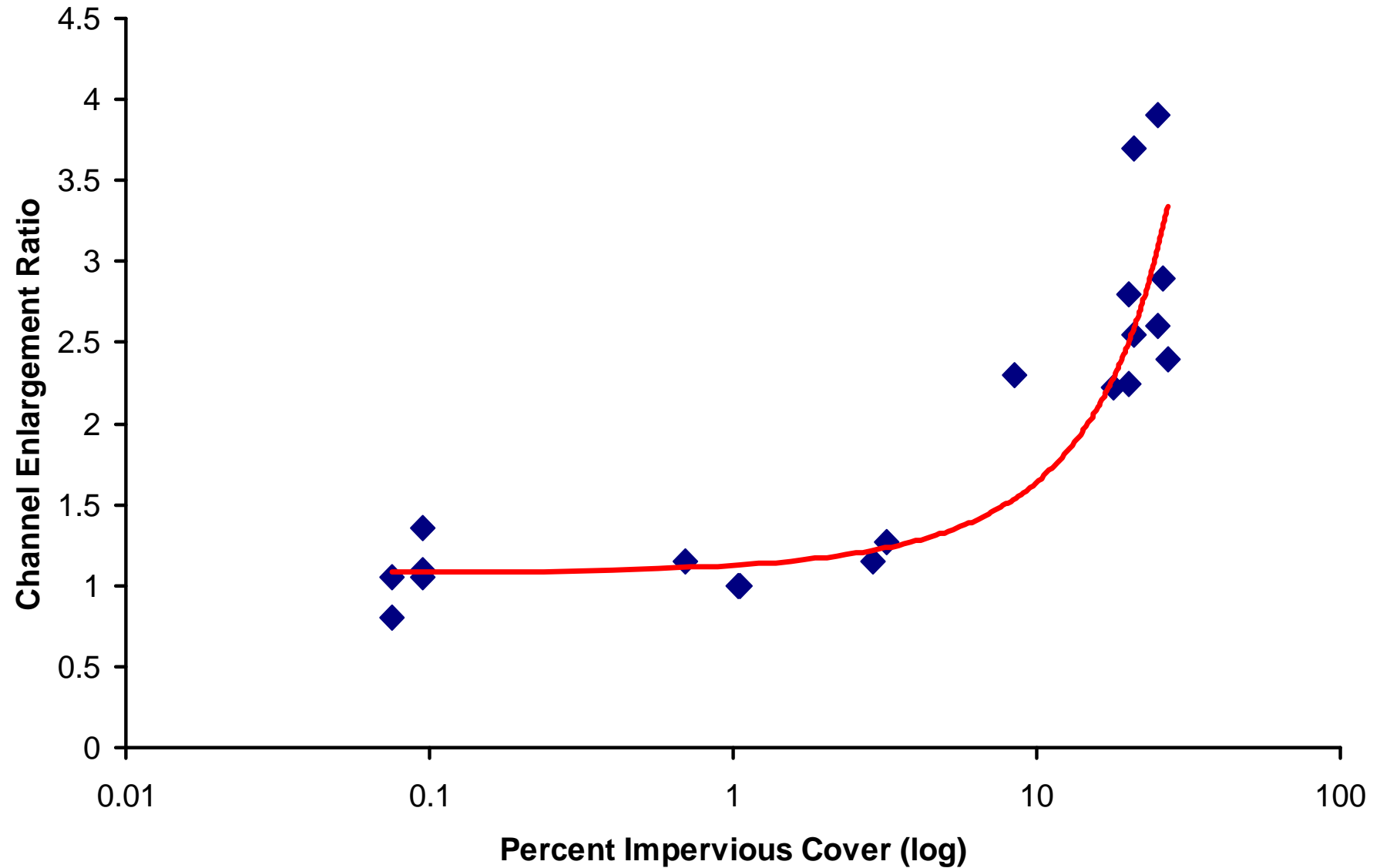
www.sccwrp.org

Green Infrastructure

- **Low impact development has left the station**
 - “common sense”
- **Many of the implementation issues are not technical**
- **Primary technical issues are efficiency in implementation**
 - Which technologies work best?
 - How much implementation do you need?



Hydromodification in Southern California Watersheds



Performance Measures

- Not all performance measures are technical
- Technical performance measures typically include effluent concentrations or masses
 - Action levels
 - TMDL targets/Waste load allocations
 - Best available technology
 - Water quality based effluent limits
- All effluent-based limits suffer from the same problem
 - How big of a storm is too big?

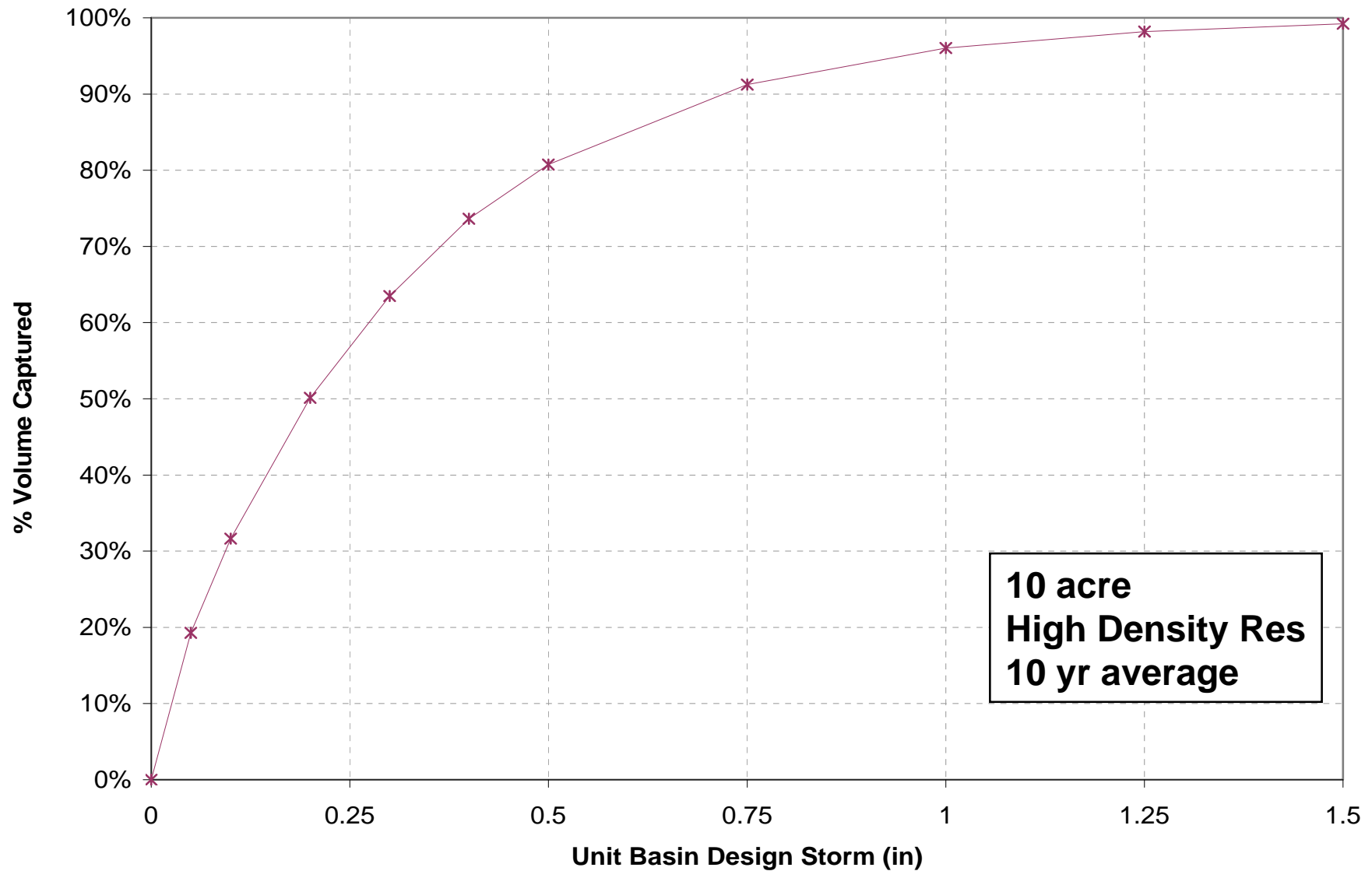
Design Storm Standards

- Design storm standards are not new
- Tremendous success implementing hydrological design storm standards
- Virtually no work on water quality
 - research limited to a small number of constituents, land use types, and rainfall patterns

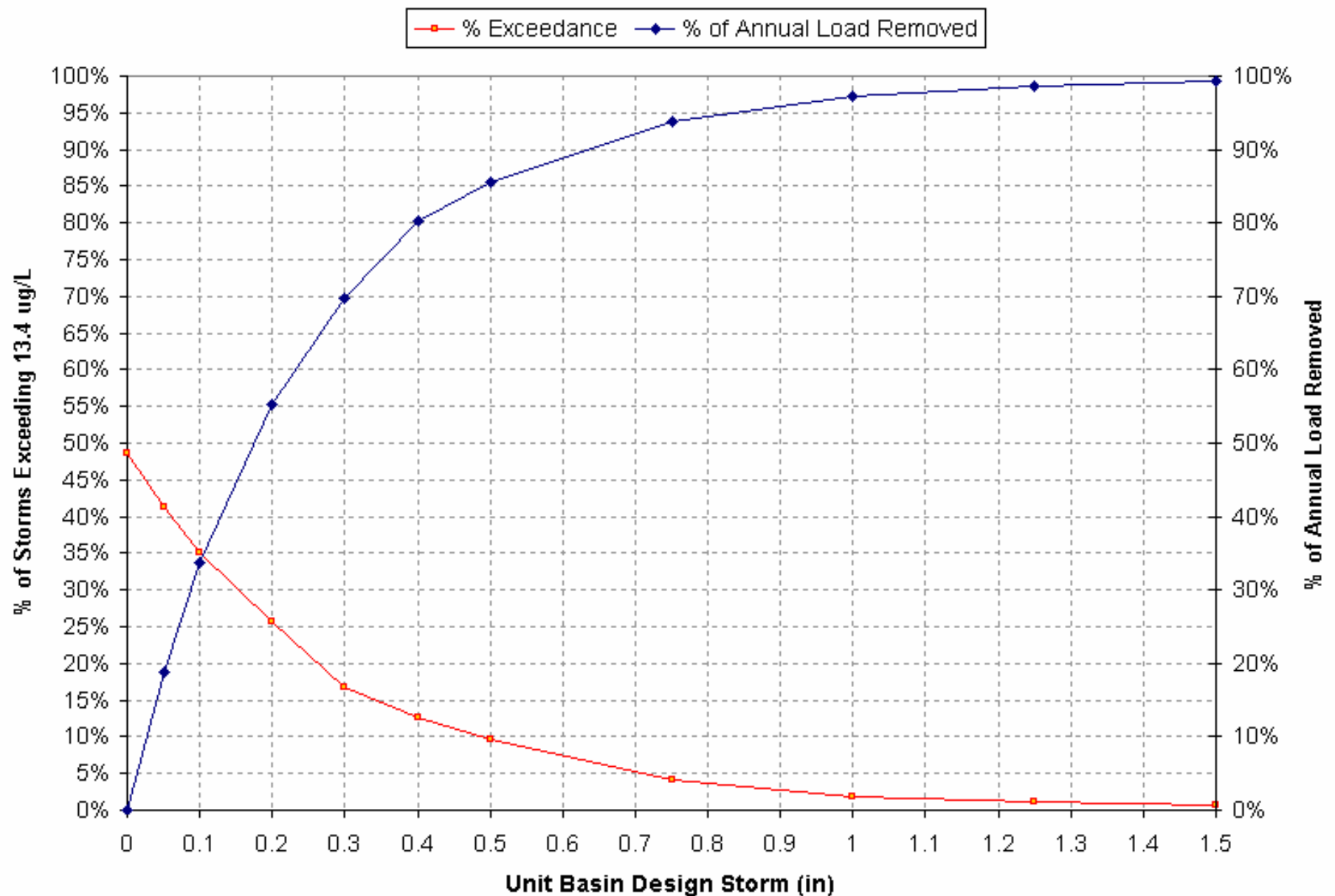


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Bioretention Basin



Dissolved Copper, 10 acre High Density Residential, 10 years



Atmospheric Deposition

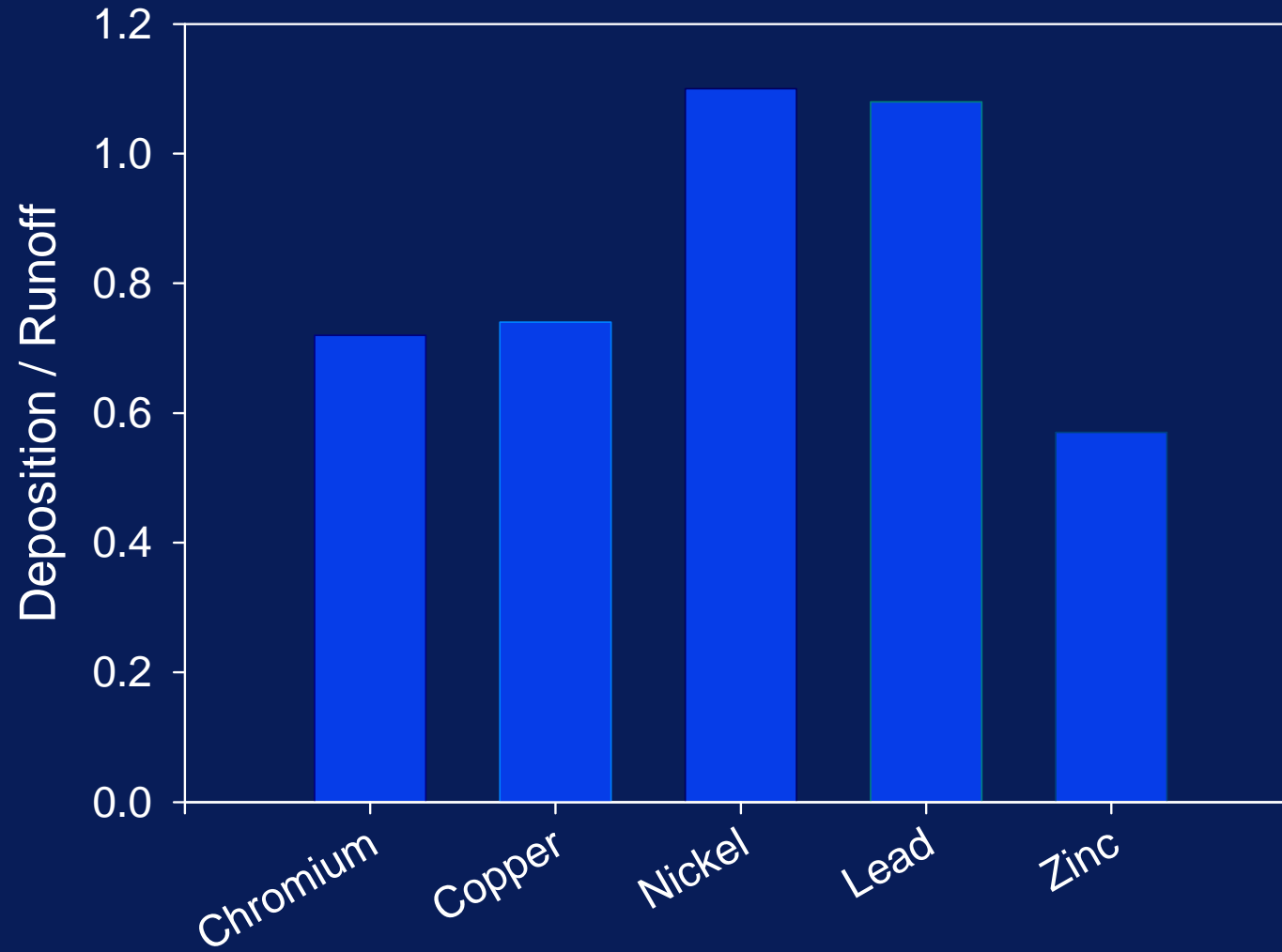
- CA cities have some of the worst air quality in the nation
- Air regulation focuses on human health
 - environmental health is not a mandate for ARB
- How much does air pollution contribute to water pollution?

Atmospheric Deposition Research

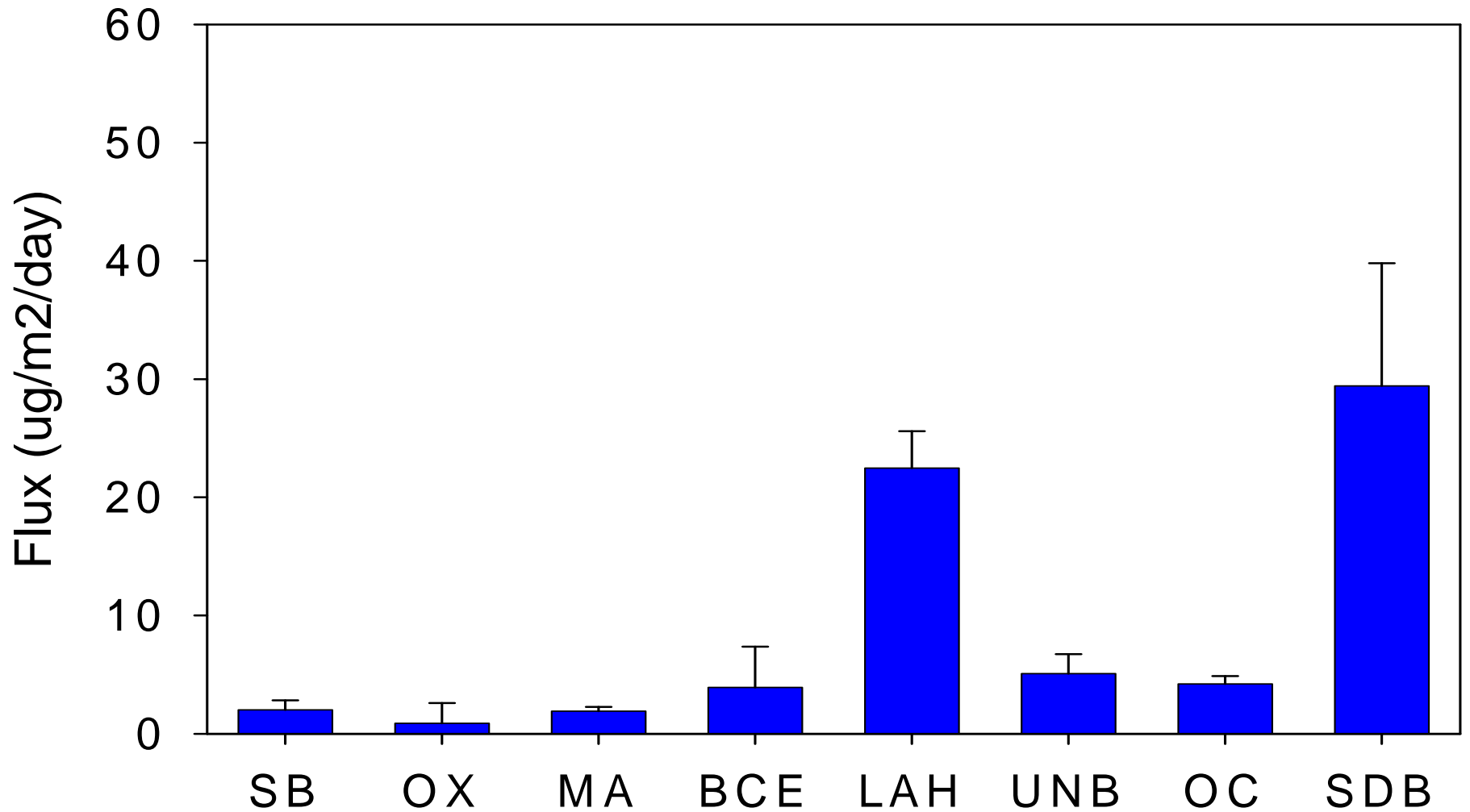
- Air can be a significant contributor to stormwater pollutant loads
 - indirect deposition
- Contributions of many constituents are not getting better with time
- Primary hurdle is working with the Air Resources agencies



Proportion of Deposition In Runoff



Comparison Among Sites



Santa Barbara



San Diego

Comparison Among Time Periods

	Flux (ug/m2/day)	
	1975	2006
Los Angeles Harbor	10	24
San Diego Bay	4	28

Natural Loading

- Many constituents are found in the most pristine environments
 - suspended solids, nutrients, metals, bacteria
- Necessary for setting management targets
- How clean is clean?

Research in Reference Areas

- **Active studies in watersheds, beaches, and marine habitats**
- **Several driving factors**
 - Hydrology, receiving water dynamics
 - Geology, land cover
- **Best accomplished through cooperative regional programs**
 - brings together regulated and regulatory communities

San Onofre Ck



Effect of Weather Condition on Beach Water Quality

